WHAT IS CLAIMED IS:

1. A detector apparatus comprising:

a movable member having light-transmitting regions disposed with a predetermined pitch and light-blocking regions between adjacent light-transmitting regions;

a pair of photoelectric elements to detect light signals passing through said light-transmitting regions of said movable member and thereby generate corresponding voltage signals in different phases A and B when the movable member is moved; and

a pair of wave-shaping circuits to generate binary signals in accordance with said voltage signals, said binary signals to allow recognition of a direction of movement of the movable member, each wave-shaping circuit including a smoothing circuit to smooth the respective voltage signal and obtain a threshold voltage and a comparator to compare the respective voltage signal and the respective threshold voltage and thereby generate one of the binary signals.

2. A detector apparatus according to Claim 1, wherein said pair of wave-shaping circuits is provided with an offset setting unit that provides an offset to the voltages obtained by smoothing said voltage signals, and generates said binary signals using threshold voltages obtained by using said offset.

3. A detector apparatus according to Claim 2, wherein said offset setting unit provides said offset by lowering a mean voltage of the voltage signal of phase A and the voltage signal of phase B and smoothing the lowered voltage, said offset being added to or subtracted from the voltages obtained by smoothing said voltage signals.

4. A detector apparatus according to Claim 1, wherein said movable member is an encoder disk on which said light-transmitting regions and said light-blocking regions alternate in a circumferential direction and having two faces, a light emitting unit is disposed opposing one face of the encoder disk, and said pair of photoelectric elements are disposed opposing the other face of the encoder disk.

5. A detector apparatus according to Claim 4, further comprising a spherical rotatable member, an encoder disk which rotates about an X axis in response to rotation of said spherical rotatable member, and an encoder disk which rotates about a Y axis perpendicular to said X axis, said pair of photoelectric elements individually provided for each of the encoder disks,

wherein movement in an X-Y coordinate system, corresponding to a direction of rotation of said spherical rotatable member, being detected based on said voltage signals of the phases A and B from the pair of photoelectric elements corresponding to one of the encoder disks and the

voltage signals of the phases A and B from the pair of photoelectric elements corresponding to the other encoder disk.

6. A method of detecting movement of a movable member, the method comprising:

detecting light signals passing through light-transmitting regions of said movable member;

generating voltage signals in different phases A and B corresponding to the detected light signals;

smoothing the voltage signals;

obtaining threshold voltages from the smoothed voltage signals;

comparing the voltage signals and the threshold voltage; and

generating binary signals from the comparisons.

7. The method according to Claim 6, further comprising:

providing an offset to the smoothed voltage signals; and

obtaining the threshold voltages from the smoothed voltage signals having the offset.

8. The method according to Claim 7, further comprising:

providing said offset by averaging the voltage signals

to produce a mean voltage, lowering the mean voltage, and smoothing the lowered voltage; and

arithmetically altering the smoothed voltage signals by the smoothed lowered voltage.

9. The method according to Claim 6, further comprising:

positioning an encoder disk that forms the movable member between a light source and light detectors; and

generating the light signals using the light source, the light signals detected by the light detectors.

10. The method according to Claim 9, further comprising:

rotating a spherical rotatable member;

rotating an encoder disk about an X axis in response to rotation of said spherical rotatable member;

rotating an encoder disk which rotates about a Y axis perpendicular to said X axis;

detecting movement in an X-Y coordinate system corresponding to a direction of rotation of said spherical rotatable member.

11. The method according to Claim 8, wherein the arithmetically altering comprises adding the smoothed lowered voltage to the smoothed voltage signals.

12. The method according to Claim 8, wherein the arithmetically altering comprises subtracting the smoothed lowered voltage from the smoothed voltage signals.

13. A method of detecting movement of a movable member, the method comprising:

detecting signals that correspond to movement of the movable member;

dynamically adjusting threshold levels to vary with changes in the detected signals;

comparing the detected signals with the threshold levels; and

generating binary signals from the comparisons.

14. The method of Claim 13, further comprising detecting movement of the movable member based on phase differences between the detected signals.

15. The method of Claim 13, wherein the detecting comprises detecting light signals passing through light-transmitting regions of said movable member.

16. The method of Claim 13, further comprising smoothing the detected signals prior to dynamically adjusting the threshold signals.

17. The method of Claim 16, further comprising

providing an offset to the smoothed signals prior to dynamically adjusting the threshold signals.

18. The method according to Claim 17, further comprising:

averaging the signals to produce a mean signal, lowering the mean signal, and smoothing the lowered signal to provide the offset; and

arithmetically altering the smoothed signals by the smoothed lowered signal.

19. The method according to Claim 13, further comprising:

rotating a spherical rotatable member;

rotating an encoder disk about an X axis in response to rotation of said spherical rotatable member;

rotating an encoder disk which rotates about a Y axis perpendicular to said X axis;

detecting movement in an X-Y coordinate system corresponding to a direction of rotation of said spherical rotatable member.